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The relationship between the preferences of the oral glucose screening test and the levels of health literacy and perinatal anxiety of pregnancy

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ABSTRACT

Aim: This research aimed to determine the relationship between pregnant women's oral glucose screening test preferences and their health literacy and perinatal anxiety levels.

Material and Method: The study is descriptive and cross-sectional. The sample of the study consisted of 120 pregnant women who applied to a university hospital between June and July 2022, were accepted to participate in the study, had no Turkish speaking problems, no pregestational diabetes diagnosis, no vision and hearing problems, no mental health problems, and were literate. The data were collected using face-to-face interviews with pregnant women including a questionnaire asking about the introductory characteristics of pregnant women, Turkish Health Literacy Scale-32 (TSOY-32), and Perinatal Anxiety Screening Scale (PASS). The obtained data were analyzed using one-way analysis of variance, correlation analysis, and chi-square tests.

Results: 52.5% of pregnant women believed that they do not need to have an OGT. While the effect of health personnel in this decisions is 66.1%, the effect of the closed environment is 22.9%. A statistically significant negative correlation at $p<.05$ level was found between the Turkish health literacy scale and the Perinatal anxiety screening scale scores. Participants' believes on the necessity of OGTT test has no effect on their TSOY-32 scores or PASS scores. There is no association between the preference of women and the sub-dimensions of TSOY-32 and the PASS.

Conclusion: The health literacy and perinatal anxiety levels of the pregnant women in the sample group did not affect their OGTT preferences. They stated that healthcare professionals were primarily influential in their decisions on OGTT preferences.

Keywords: Gestational diabetes mellitus, glucose tolerance test, health literacy, perinatal anxiety

INTRODUCTION

Gestational diabetes mellitus (GDM) is one of pregnancy's most common medical complications (1). It is carbohydrate intolerance that occurs in the second or third trimester of pregnancy, although the individual does not have type 1 or type 2 diabetes before. When the results of studies conducted in many countries are compared with the data in 1980, it is stated that the prevalence has doubled. One in seven births worldwide has GDM. Women diagnosed with GDM and their children experience complications caused by hyperglycemia and hyperinsulinemia in the short and long term (2). GDM is a crucial issue causing mortality and morbidity in both mothers and their babies. Obesity, maternal age, impaired glucose tolerance in previous pregnancies, and fetal macrosomia are some of the risk factors for GDM. It can lead to complications including preeclampsia, preterm delivery, polyhydramnios, malformations, shoulder dystocia, neonatal hypoglycemia, and perinatal mortality (3,4). Diabetes, insulin resistance, metabolic syndrome, cerebral palsy, and developmental disorders are among the complications expected in the long term in the babies of mothers with GDM. With early diagnosis, it is possible to treat the majority of these complications (5,6). In studies conducted in our country, the frequency of GDM varies between 1-9%. It is estimated that 21.1 million live births in 2021 have some form of hyperglycemia in pregnancy. 80.3% of these are due to gestational diabetes mellitus (2,7,8).

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The American Diabetes Association (ADA) recommends the classification of pregnant women according to risk factors and the application of screening steps accordingly. Organizations such as the American Society of Obstetricians and Gynecologists (ACOG), the World Health Organization (WHO), and the International Diabetes and Pregnancy Working Group (IADPSG) recommend screening of all pregnant women. The approach in our country; is the screening of all pregnant women for GDM with the recommendation of the Turkish Society of Endocrinology and Metabolism (TEMD) and the Turkish Society of Gynecology and Obstetrics (TJOD). Currently, there is no other proven diagnostic method for the diagnosis of GDM other than the Oral Glucose Tolerance Test (OGTT) (9-12).

Cultural dietary habits and misinformation from mass media negatively affect the rate of OGTT of pregnant women in Turkey. This might possess an increased risk of GDM and related complications. Therefore, it is important to evaluate the variables affecting the OGTT preference of pregnant women (4). Individuals' health literacy levels are an important variable that affects their health levels. The World Health Organization defines health literacy as "cognitive and social skills that determine the motivation and ability of individuals to access, understand and use information in ways that promote and maintain good health". Health literacy, the ability to access, understand, evaluate and apply health information to make appropriate health decisions, is generally accepted as a mediator in the processes that determine certain health behaviors and ultimately health status (13-16). People with a high level of health literacy are often expected to avoid risky health behaviors. When evaluated in terms of health promotion practices, health literacy means that the individual has information about his/her health status and knows how to make changes related to his/her health (17,18). Physiological symptoms of pregnancy, changes in body image, labor, anxiety about becoming a mother, and worries about the baby during pregnancy cause stress. The effort of the pregnant woman to adapt to the role of motherhood and the expectations of the people around her about being a good mother increase the level of stress. Pregnant woman Stress during pregnancy may cause the pregnant woman to have difficulty in performing daily life activities or, on the contrary, to gain healthy lifestyle habits (19).

This study aims to examine the relationship between pregnant women's oral glucose screening test preferences and their health literacy and perinatal anxiety levels. Attempts to improve the low rates of OGTT in pregnant women will be effective in ensuring the continuity of health-promoting and protective behaviors of expectant mothers and mothers. Preventing the increase in GDM rates will improve health by protecting maternal and infant health. It is thought that the potential risks of the diagnosis of GDM for the mother and the baby will decrease and the expenditures for care and treatment will thus contribute to the national economy.

Research Question

Are pregnant women's health literacy and perinatal anxiety levels effective in their OGTT preferences?

Is there a relationship between health literacy and perinatal anxiety levels of pregnant women?

MATERIAL AND METHOD

Type of Research

The research is descriptive and cross-sectional.

Place of Research

The research was carried out in the pregnant outpatient clinic of XXXXXX University Medical Faculty Hospital between July 2022 and August 2022.

Population and Sample of the Research

The population of the study consisted of pregnant women who applied to the pregnancy polyclinic of XXXXXXX University Medical Faculty Hospital. The sample of the study; consisted of 120 pregnant women, who did not have a Turkish speaking problem, a diagnosis of pregestational diabetes, no vision and hearing problems, no mental/mental health problems, and who could read and write. Being a health worker was accepted as an exclusion criterion.

Data Collection and Data Collection Tools

Study data were collected using a sociodemographic information form consisting of 12 questions, the Turkish Health Literacy Scale-32 to find out the health literacy levels of pregnant women, and the Perinatal Anxiety Screening Scale to determine the perinatal anxiety levels. The pregnant women who participated in the study were informed about the study and a voluntary consent form was signed. Data collection was carried out under the supervision of the researcher by interviewing the pregnant women face-to-face. It took approximately 20 minutes for the data collection forms to be filled out by the pregnant women.

Turkey Health Literacy Scale-32 (TSOY-32).

TSOY-32 is a self-report scale developed to evaluate the health literacy of literate people over the age of fifteen (20).

It is a 32-item scale developed based on the HLS-EU Study Conceptual Framework (HLS-EU CONSORTIUM, 2012). TSOY-32 consists of two dimensions: Treatment and Service and Prevention from Diseases/Promotion of Health. Each dimension includes four components: Accessing Health-Related Information, Understanding Health-Related Information, Evaluating Health-Related Information, and Using/Practicing Health-Related Information. Okyay et al. (2016) conducted a validity and reliability study in our country. Items in a 5-point Likert-type scale are expressed as 0= very easy, 1= easy, 2= difficult 3= very difficult, 4= I have no idea. In the evaluation of the scale; indices are standardized to be between 0 and 50, as in the HLSEU study. In this formula, the index refers to the index calculated specifically for the individual, and the average refers to the average of each item answered by a person. After this calculation, 0 indicates the lowest health literacy, and 50 is the highest health literacy.

As in the HLS-EU study, the index obtained was classified into four categories.

Health literacy according to the following scoring,

(0-25) points: insufficient health literacy,

(>25-33): problematic – limited health literacy,

(>33-42): adequate health literacy,

(>42-50): defined as excellent health literacy.

The reliability of the scale in Turkish; internal consistency (Cronbach Alpha) coefficient; 0.927.

The internal consistency (Cronbach's Alpha) coefficient for this study was 0.934.

Perinatal Anxiety Screening Scale (PASS)

Developed by Somerville et al. in 2014, Yazıcı et al. The Turkish validity and reliability study of the scale consists of 31 items. The four sub-dimensions of the scale are (1) acute anxiety and adjustment disorder, (2) general anxiety and specific fear, (3) perfectionism, control, and trauma, and (4) social anxiety. The questions/item answers in the scale are "never", "sometimes", "often" and "almost always" and the scores are 0, 1, 2, 3. Evaluation of the scores obtained from the scale was calculated as 0-20 for minimal anxiety symptoms, 21-41 for moderate anxiety, and 42-93 for severe anxiety (21). The Cronbach alpha value of the scale was determined by Somerville et al. 0.96 by Yazici et al. found 0.95 by Yazici et al. 2018.

Evaluation of Data

The data were evaluated by coding in the SPSS 26.0 statistical package program. Descriptive statistics such as number, percentage, mean and standard deviation were used in the analysis of the data. Normality test was used to determine the suitability of the data for normal distribution, one-way analysis of variance, correlation analysis, independent sample t-test, and chi-square tests were used to determine the difference of scale scores according to the variables. The significance level was evaluated according to p=0.05.

Ethical Aspect of Research

The study was initiated with the approval of the Alanya Alaaddin Keykubat University Health Sciences Scientific Research and Publication Ethics Committee (Date: 31.05.2022, Decision No: 2022/12), and permission from the hospital management where the research was carried out were obtained before the study to implement the study. In addition, informed consent was read from the pregnant women who participated in the study, and their written and verbal consents were obtained. The Helsinki Declaration of Principles has been complied with.

Limitations of the Research

The data obtained from this study are based on the statements of the pregnant women, and the results are valid for the group in which the study was conducted and cannot be generalized to the population.

RESULTS

In the study, which aimed to investigate the relationship between glucose screening test preferences of pregnant women and their health literacy and perinatal anxiety levels, 39% of the pregnant women forming the sample group were in the 29-33 age group, 39.8% were secondary school graduates, and 77.1% were not working. 70.3% of the pregnant women stated that they lived in the district center and 61% stated that their monthly income was above the minimum wage. One of the pregnant women who participated in the study stated that it was her 9th pregnancy, and 40.7% of them stated that it was her first pregnancy. As the number of pregnancies increased, the percentage of pregnant women in the group decreased. While 83.1% of the pregnant women stated that they did not have any health problems in their previous pregnancies, 94.1% stated that they went to regular health check-ups. When asked about the opinions of pregnant women about having OGTT, 52.5% of participants answered "No" to the question "Do you think OGTT should be done?" While the effect of health personnel in these decisions is 66.1%, the effect of the closed environment is 22.9%. The Cronbach Alpha of the Health Literacy Scale used in the study was .937; the Perinatal Anxiety Screening Scale Cronbach Alpha value was found to be .944.

Table 1. The Relationship Between Turkish Health Literacy and Perinatal Anxiety Screening Scale in Pregnants

Scales	Turkey Health Literacy Scale-32	Perinatal Anxiety Screening Scale
Turkey Health Literacy Scale-32	one	-,182*
Perinatal Anxiety Screening Scale	-,182*	One

* p < 0.05

A statistically significant negative correlation was found between the scores of Turkish health literacy scale and the scores obtained from the Perinatal anxiety screening scale, at the p<.05 level (r= -.182; p<.05) with Pearson Product Moment Correlation analysis.

In **Table 2**, there is no difference between the groups in terms of health literacy (F=,696 p>.05), and perinatal anxiety screening scale (F=,002 p>.05) scores of pregnant women.

Table 2. Anova Results of Pregnants' Health Literacy and Perinatal Anxiety Screening Scores

	Sum of Squares	sd	Mean Squares	F	p
STRAIN*					
between groups	,625	one	,625	,696	,406
within groups	104,231	116	,899		
Total	104,856	117			
PAT**					
between groups	,001	one	,001	,002	,963
within groups	75,456	116	,650		
Total	75,458	117			

* Health literacy **Perinatal anxiety screening

Health literacy mean scores of pregnant women who said that OGTT should or should not be done in **Table 3** were analyzed by Mann-Whitney U test analysis. There is no difference between the mean health literacy scores of pregnant women according to the preference variable (U = 1715,000 p=,655, z=-,446).

Table 3. Results of Pregnants' Health Literacy Scale Mean Scores by OGTT Preference Variable

OGTT Preference	n	Row Average	Row Sum	U	Z	p
Should be done	60	61,92	3715,00	1715,000	-,446	,655
Should not be done	60	59,08	3545,00			

Perinatal Anxiety Screening Scale mean scores of pregnant women who said that OGTT should or should not be performed in **Table 4** were analyzed by Mann-Whitney U test analysis. There is no difference between the Perinatal Anxiety Screening Scale mean scores according to the preference variable of the pregnant women (U = 1749,000 p=.906, z=-.119).

Table 4. U-Test Results of Pregnants' Perinatal Anxiety Screening Scale Mean Scores According to OGTT Preference Variable

OGTT Preference	n	Row Average	Row Sum	U	Z	p
Should be done	60	60,35	3621,00	749,000	-,119	,906
Should not be done	59	59,64	3519,00			

In **Table 5**, the OGTT preference of pregnant women according to sub-dimensions of health literacy and perinatal anxiety scales was evaluated with Chi-Square analysis. There is no association between the preference and the mean scores of the sub-dimensions of the Health Literacy Scale (X 2 = 3.243, p = 0.356). There is association between the preference and the mean scores of the perinatal anxiety screening scale sub-dimensions (X2=,488, p = 0.784) (**Table 5**).

Table 5. Analysis of Pregnant Women's OGTT Preferences by Health Literacy and Perinatal Anxiety Scales

				Health literacy				
	Unsatisfactory	Problem-Limited	Adequate	Excellent	Total	X2	sd	p
OGTT								
Should it be done?								
Yes	49	4	6	1	60	3,243	3	,356
No	54	4	2	0	60			
				Perinatal anxiety				
	Minimal	Moderity	Severe	Total	X2	sd	p	
OGTT								
Should it be done?								
Yes	18	24	8	60	,488	2	,784	
No	20	20	19	60				

DISCUSSION

The data of this study, which aimed to investigate the relationship between oral glucose screening test preferences of pregnant women and their health literacy and perinatal anxiety levels, were discussed by comparing them with the literature. GDM can occur at any time during the antenatal period and is not expected to persist after birth. Hyperglycemia in pregnancy is best detected in the first trimester. It is estimated that most of the cases of hyperglycemia in pregnancy (75%-90%) are GDM (22).

There is no global consensus on surveillance and diagnostic testing for GDM, thresholds for each test, or if it should be administered selectively (23,24). However, there is not enough evidence as to why testing should be done during these weeks of pregnancy; OGTT is recommended for all women between 24 and 28 weeks of pregnancy as GDM screening test. For high-risk women, screening should be done earlier in pregnancy (25). Also, earlier OGTT may reduce exposure to fetal hyperglycemia, providing opportunities for earlier treatment (26). It is estimated that women in 21.1 million (16.7%) live births in 2021 have some form of hyperglycemia during pregnancy. Of these, 80.3% are due to gestational diabetes mellitus (GDM), 10.6% to diabetes diagnosed before pregnancy, and 9.1% to diabetes diagnosed for the first time during pregnancy (including type 1 and type 2) (27).

Basbuğ et al. (28) in their studies, the frequency of GDM was found to be 7.9% in the OGTT group. In our study, 52.5% of pregnant women, according to you, should OGTT be performed? They answered no to the question. 66.1% of pregnant women stated that health workers were effective in their decisions. Dalgıç et al. (29), 51.9% of the pregnant women did not have a screening test, and some pregnant women reported that screening should be done with a method other than sugar consumption as the reason for not having the test, that their doctor did not recommend it, that they read in the media that it was harmful, that they thought it would harm their baby, and that they had no information about the test.

Turan and Toker (30), in their study, found that the socio-demographic, health and obstetric characteristics of pregnant women did not affect the OGTT behavior; It was determined that they did not have the test because they thought that the test was not necessary, they were worried that it would be harmful to themselves and their babies, and their doctors did not recommend it. Acavut et al. (31), it is noteworthy that although almost all of the pregnant women knew about the OGTT and stated that they had it done in their previous pregnancy, less than half of them would have the test done. This result suggests that the knowledge level of pregnant women is not sufficient, they are indecisive about getting tested, and the news on social media is effective in their thoughts. In the study by Hocaoğlu et al. (32), it was stated that 78.5% of pregnant women were reluctant to have the test done because they thought that OGTT was harmful to them and their babies. In Koyucu's (33) study, 64.3% of pregnant women think that OGTT screening should not be performed. The biggest reason for this is the fear that it may have harmful effects on the pregnancy process, the fetus, or the newborn after birth. In our study, a statistically significant negative correlation at $p<.05$ level was found between the scores obtained from the Turkish health literacy scale and the perinatal anxiety screening scale ($r= -.182$; $p<.05$). Nacar et al. (34), it was determined that the mean anxiety score of the pregnant women who had triple screening test and oral glucose tolerance test, which are among the perinatal screening tests, were higher than those who did not.

It is thought that this situation may be due to the possibility of getting a negative result from the test result.

Suny et al. (36) evaluated the barriers to mothers diagnosed with GDM in terms of risk follow-up for Type 2 Diabetes in the postpartum period. These barriers were stated as the mothers' perceived risk of developing Type 2 DM, the risk of T2DM and fear of its consequences, the desire to pay attention to the care of their child, and the ordering of their priorities.

In our study, when the OGTT preferences of pregnant women were examined according to health literacy and perinatal anxiety screening scale sub-dimensions, no statistically significant relationship was found. Dika et al. (13) found a strong and inversely significant relationship between blood sugar level and health literacy. It shows that mobile phone applications created considering the health literacy levels of pregnant women have the potential to prevent and improve GDM management (37). Demircan et al. (38), the GDM awareness rate of pregnant women was found to be 56.8%. In addition, it has been determined that doctors and healthcare professionals significantly lack knowledge about the pathogenesis, screening, follow-up, and treatment of GDM. In the study of Tarhan and Özaydın (35), it is stated that the education applied with the audio-visual supported pictorial training guide for pregnant women positively affects the knowledge level of patients about diabetes and their preferences for screening tests.

CONCLUSION

As a result, it was seen that the health literacy and perinatal anxiety levels of the pregnant women in the sample group did not affect their OGTT preferences. They stated that healthcare professionals were primarily influential in their decisions on OGTT preferences. Since GDM is a common health problem, early diagnosis and treatment are crucial for the prevention of maternal and fetal complications. The first step to this is the implementation of the OGTT. In our country, pregnant women, who are especially affected by visual media, oppose the screening test. It is thought that the discussions about OGTT in the media are effective in the decision process regarding the test. It is reported that not performing a test, which emphasizes the importance of doing it during pregnancy, may harm both the mother and the baby. Therefore, it is important to determine the factors that may affect the OGTT preferences of pregnant women and more studies are needed on this subject. These studies should also include the knowledge and approaches of health professionals.

It is important to plan interventions for GDM and its prevention, which are effective on infant and maternal health, through individualized support and culture-specific approaches. It is possible to support women with GDM in managing and understanding their condition, by providing multidisciplinary teams with the necessary knowledge regarding the needs and concerns of GDM patients. Also, this approach could potentially improve infant and maternal health, reduce the risk of future Type 2 diabetes in this population, and cost pressures on health systems, in the long term.liation in gastric cancer patients. Oncological outcomes may be improved with early radiotherapy initiation and higher bioequivalent RT doses. Current study demonstrated that the referral symptom for palliation has an impact on the oncologic outcome. Better results were shown in patients who received radiotherapy for pain compared to bleeding and obstruction. Prospective randomized studies are needed for further results.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was initiated with the approval of the Alanya Alaaddin Keykubat University Health Sciences Scientific Research and Publication Ethics Committee (Date: 31.05.2022, Decision No: 2022/12).

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper and that they have approved the final version.

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